## J.3.1 TRANSPORTATION MODES, ROUTES, AND NUMBER OF SHIPMENTS

### J.3.1.1 Routes in Nevada for Legal-Weight Trucks

The analysis of impacts that would occur in Nevada used the characteristics of highways in Nevada that would be used for shipments of spent nuclear fuel and high-level radioactive waste by legal-weight trucks. Specifically, the base case for the analysis used routing for the Las Vegas Northern and Western Beltway to transport spent nuclear fuel and high-level radioactive waste. The distance and population density by county was obtained from Geographical Information System data for the State of Nevada using 1990 Census data. The population density data was escalated to 2035.

Figure J-10 shows the routes in Nevada that legal-weight trucks would use unless the State designated alternative or additional preferred routes. The figure shows estimates for the number of legal-weight truck shipments that would travel on each route segment for the mostly legal-weight truck and mostly rail transportation scenarios. The inset on Figure J-10 shows the Las Vegas Beltway and the routes DOE anticipates legal-weight trucks traveling to the repository would use.

### J.3.1.2 Highway and Rail Routes in Nevada for Transporting Rail Casks

The rail and heavy-haul truck implementing alternatives for transportation in Nevada include five possible rail corridors and five possible routes for heavy-haul trucks; the corridors and routes for these implementing alternatives are shown in Figures J-11 and J-12. These figures also show the estimated number of rail shipments that would enter the State on mainline railroads. These numbers indicate shipments that would arrive from the direction of the bordering state for each of the implementing alternatives for the mostly rail transportation scenario.

Table J-33 lists the total length and cumulative distance in rural, suburban, and urban population zones and the population density in each population zone in the State of Nevada used to analyze impacts of the implementing alternatives. Table J-34 lists the cumulative distance in rural, suburban, and urban population zones and the population density in each population zone for existing commercial rail lines in Nevada. DOE based the estimated population that would live along each branch rail line on population densities in census blocks along the candidate rail corridors in Nevada. The populations are based on 1990 Census data escalated to 2035. For this analysis, the ending rail nodes in Nevada for commercial rail lines would be origins for the rail and heavy-haul truck alternatives listed in Table J-33. Table J-35 lists the total population that lives within 800 meters (0.5 mile) of rail lines in Nevada.

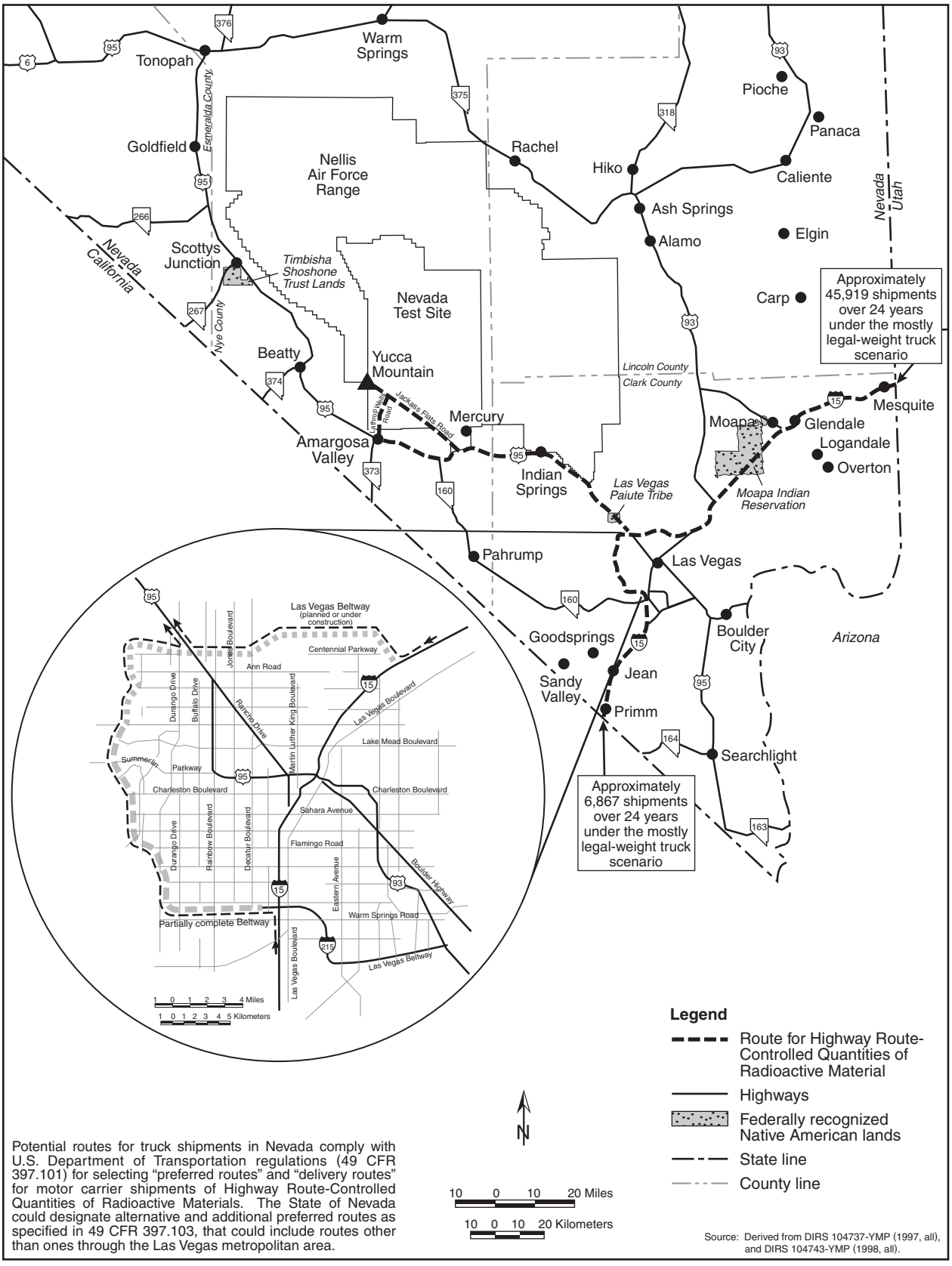
#### *Nevada Heavy-Haul Truck Scenario*

Tables J-36 through J-40 summarize the road upgrades for each of the five possible routes for heavy-haul trucks that DOE estimates would be needed before routine use of a route to ship casks containing spent nuclear fuel and high-level radioactive waste.

#### *Nevada Rail Corridors*

Under the mostly rail scenario, DOE could construct and operate a branch rail line in Nevada. Based on the studies listed below, DOE has narrowed its consideration for a new branch rail line to five potential rail corridors—Carlin, Caliente, Caliente-Chalk Mountain, Jean, and Valley Modified. DOE identified the five rail corridors through a process of screening potential rail alignments that it had studied in past years. Several studies evaluated rail transportation.

- The *Feasibility Study for Transportation Facilities to Nevada Test Site* study (DIRS 104777-Holmes & Narver 1962, all) determined the technical and economic feasibility of constructing and operating a railroad from Las Vegas to Mercury.




Potential routes for truck shipments in Nevada comply with U.S. Department of Transportation regulations (49 CFR 397.101) for selecting "preferred routes" and "delivery routes" for motor carrier shipments of Highway Route-Controlled Quantities of Radioactive Materials. The State of Nevada could designate alternative and additional preferred routes as specified in 49 CFR 397.103, that could include routes other than ones through the Las Vegas metropolitan area.

**Figure J-10.** Potential Nevada routes for legal-weight trucks and estimated number of shipments.

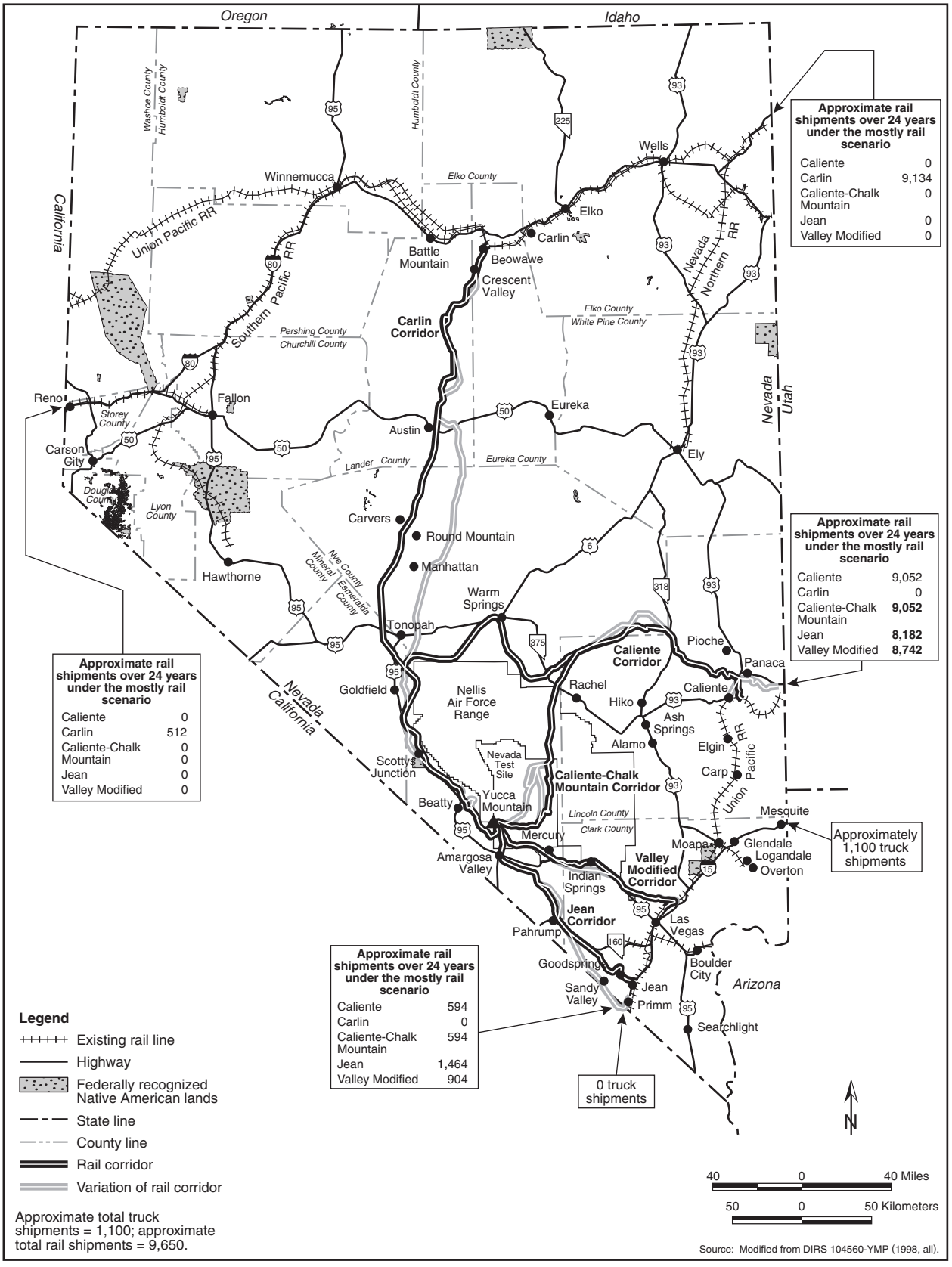



**Figure J-11.** Potential Nevada rail routes to Yucca Mountain and estimated number of shipments.

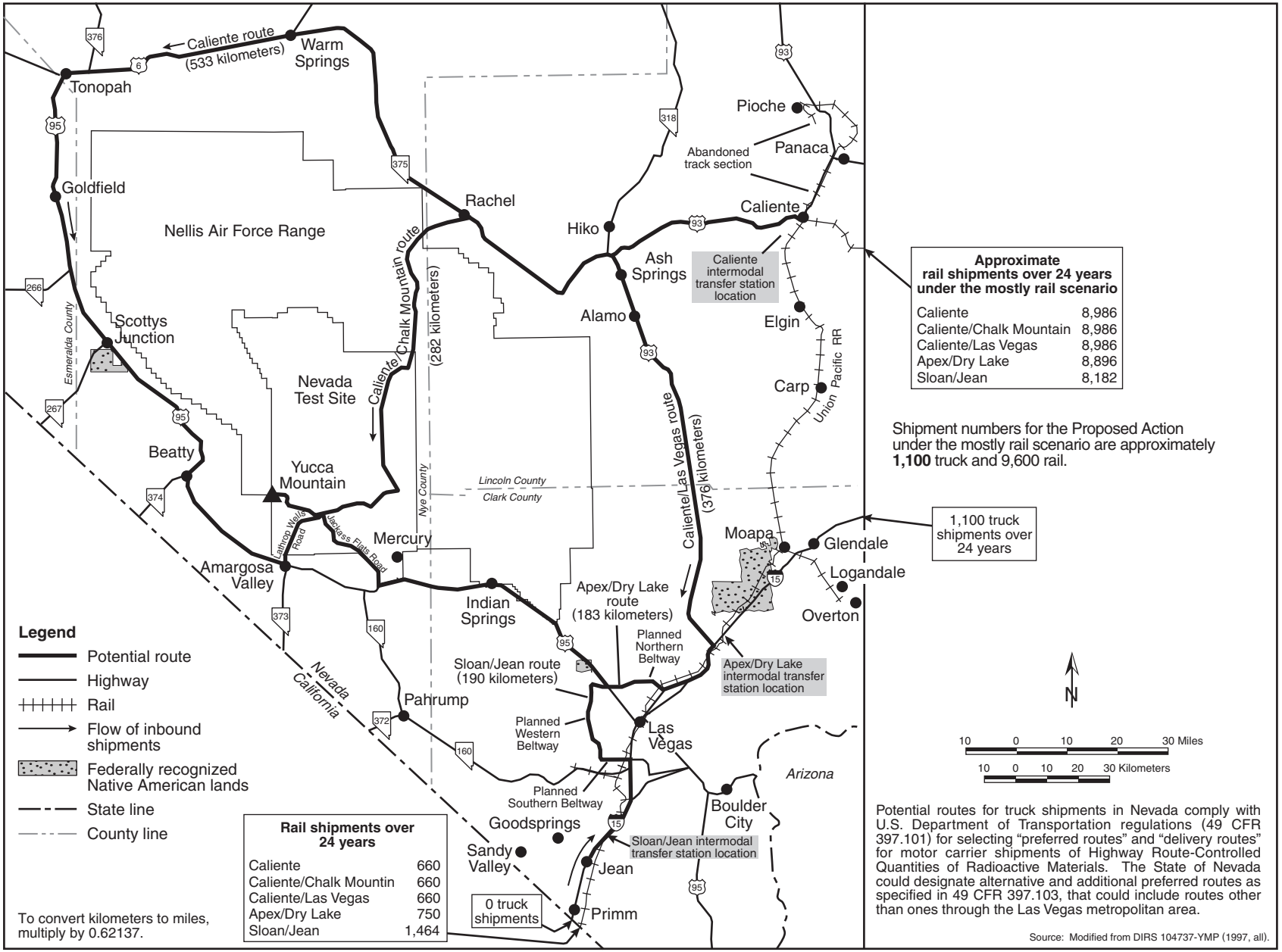



**Figure J-12.** Potential Nevada routes for heavy-haul trucks and estimated number of shipments.

**Table J-33.** Routing characteristics in Nevada for legal-weight truck, rail and heavy-haul truck implementing alternatives.

| Route | County | Distance (kilometers)[a] | | | | Population density (persons per square kilometer) | | |
|---|---|---|---|---|---|---|---|---|
| | | Urban | Suburban | Rural | Total | Urban | Suburban | Rural |
| *Legal-weight truck route in Nevada using the Las Vegas Beltway* | | | | | | | | |
| Northern route | Clark | 0.0 | 19.9 | 187.5 | 207.4 | 0.0 | 577 | 10.6 |
| Northern route | Nye | 0.0 | 0.0 | 64.7 | 64.7 | 0.0 | 0.0 | 0.0 |
| Southern route | Clark | 0.0 | 41.9 | 126.9 | 168.8 | 0.0 | 577 | 3.5 |
| Southern route | Nye | 0.0 | 0.0 | 64.7 | 64.7 | 0.0 | 0.0 | 0.0 |
| *Rail alternatives* | | | | | | | | |
| Caliente-Chalk Mountain | Lincoln | 0.0 | 0.0 | 158.0 | 158.0 | 0.0 | 0.0 | 0.0 |
| Caliente-Chalk Mountain | Nye | 0.0 | 0.0 | 188.0 | 188.0 | 0.0 | 0.0 | 0.0 |
| Caliente | Esmeralda | 0.0 | 0.0 | 4.0 | 4.0 | 0.0 | 0.0 | 0.3 |
| Caliente | Lincoln | 0.0 | 0.0 | 148.5 | 148.5 | 0.0 | 0.0 | 0.0 |
| Caliente | Nye | 0.0 | 0.0 | 360.8 | 360.8 | 0.0 | 0.0 | 0.1 |
| Carlin | Eureka | 0.0 | 0.0 | 29.8 | 29.8 | 0.0 | 0.0 | 0.1 |
| Carlin | Lander | 0.0 | 0.0 | 158.7 | 158.7 | 0.0 | 0.0 | 0.0 |
| Carlin | Esmeralda | 0.0 | 0.0 | 41.0 | 41.0 | 0.0 | 0.0 | 0.4 |
| Carlin | Nye | 0.0 | 0.0 | 291.5 | 291.5 | 0.0 | 0.0 | 0.6 |
| Jean | Clark | 0.0 | 0.0 | 82.4 | 82.4 | 0.0 | 0.0 | 0.8 |
| Jean | Nye | 0.0 | 0.0 | 98.2 | 98.2 | 0.0 | 0.0 | 0.2 |
| Apex | Clark | 0.0 | 0.0 | 99.5 | 99.5 | 0.0 | 0.0 | 0.1 |
| Apex | Nye | 0.0 | 0.0 | 59.2 | 59.2 | 0.0 | 0.0 | 0.0 |
| *Heavy-haul alternatives* | | | | | | | | |
| Apex/Dry Lake | Clark | 0.0 | 19.9 | 104.0 | 123.9 | 0.0 | 577 | 2.9 |
| Apex/Dry Lake | Nye | 0.0 | 0.0 | 59.4 | 59.4 | 0.0 | 0.0 | 0.001 |
| Caliente | Esmeralda | 0.0 | 0.0 | 71.6 | 71.6 | 0.0 | 0.0 | 2.0 |
| Caliente | Lincoln | 0.0 | 0.0 | 148.5 | 148.5 | 0.0 | 0.0 | 0.8 |
| Caliente | Nye | 0.0 | 4.7 | 308.5 | 313.2 | 0.0 | 261 | 0.7 |
| Caliente/Las Vegas | Clark | 0.0 | 19.9 | 147.3 | 167.2 | 0.0 | 577 | 2.1 |
| Caliente/Las Vegas | Lincoln | 0.0 | 0.0 | 149.7 | 149.7 | 0.0 | 0.0 | 0.8 |
| Caliente/Las Vegas | Nye | 0.0 | 0.0 | 59.4 | 59.4 | 0.0 | 0.0 | 0.001 |
| Caliente/Chalk Mountain | Lincoln | 0.0 | 0.0 | 146.9 | 146.9 | 0.0 | 0.0 | 0.9 |
| Caliente/Chalk Mountain | Nye | 0.0 | 0.0 | 135.3 | 135.3 | 0.0 | 0.0 | 0.0 |
| Jean/Sloan | Clark | 0.0 | 41.9 | 88.6 | 130.5 | 0.0 | 577 | 5.3 |
| Jean/Sloan | Nye | 0.0 | 0.0 | 59.4 | 59.4 | 0.0 | 0.0 | 0.0006 |

a. To convert kilometers to miles, multiply by 0.62137.

- The *Preliminary Rail Access Study* (DIRS 104792-YMP 1990, all) identified 13 and evaluated 10 rail corridor alignment options. This study recommended the Carlin, Caliente, and Jean Corridors for detailed evaluation.

- *The Nevada Railroad System: Physical, Operational, and Accident Characteristics* (DIRS 104735-YMP 1991, all) described the operational and physical characteristics of the current Nevada railroad system.

- The *High Speed Surface Transportation Between Las Vegas and the Nevada Test Site (NTS)* report (DIRS 104786-Cook 1994, all) explored the rationale for a potential high-speed rail corridor between Las Vegas and the Nevada Test Site to accommodate personnel.

- The *Nevada Potential Repository Preliminary Transportation Strategy, Study 1* (DIRS 104795-CRWMS M&O 1995, all), reevaluated 13 previously identified rail routes and evaluated a new route called the Valley Modified route. This study recommended four rail corridors for detailed evaluation—Caliente, Carlin, Jean, and Valley Modified.

**Table J-34.** Routing characteristics in Nevada for existing commercial rail lines.

| End node | Route | County | Distance (kilometers)[a] | | | | Population density (persons per square kilometer) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Urban | Suburban | Rural | Total | Urban | Suburban | Rural |
| Beowawe | NV existing rail via Utah | Eureka | 0.0 | 0.0 | 31.5 | 31.5 | 0.0 | 0.0 | 0.1 |
| Beowawe | NV existing rail via Utah | Elko | 0.0 | 11.3 | 218.1 | 229.3 | 0.0 | 463.4 | 2.0 |
| Beowawe | NV existing rail via Reno | Humboldt | 0.0 | 6.4 | 103.8 | 110.2 | 0.0 | 431.4 | 5.5 |
| Beowawe | NV existing rail via Reno | Pershing | 0.0 | 3.2 | 117.8 | 121.0 | 0.0 | 377.0 | 2.6 |
| Beowawe | NV existing rail via Reno | Lander | 0.0 | 3.2 | 41.0 | 44.3 | 0.0 | 577.3 | 3.5 |
| Beowawe | NV existing rail via Reno | Eureka | 0.0 | 0.0 | 22.7 | 22.7 | 0.0 | 0.0 | 0.1 |
| Beowawe | NV existing rail via Reno | Washoe | 3.2 | 23.3 | 26.8 | 53.4 | 1,953.2 | 517.6 | 14.9 |
| Beowawe | NV existing rail via Reno | Churchill | 0.0 | 0.0 | 66.8 | 66.8 | 0.0 | 0.0 | 0.0 |
| Beowawe | NV existing rail via Reno | Storey | 0.0 | 2.4 | 18.0 | 20.4 | 0.0 | 199.9 | 8.7 |
| Beowawe | NV existing rail via Reno | Lyon | 0.0 | 3.2 | 14.7 | 18.0 | 0.0 | 586.9 | 12.9 |
| Jean | NV existing rail Jean from south | Clark | 0.0 | 0.0 | 41.7 | 41.7 | 0.0 | 0.0 | 1.0 |
| Jean | NV existing rail Jean from north | Clark | 3.2 | 17.7 | 110.0 | 130.9 | 1,879.6 | 750.6 | 0.8 |
| Jean | NV existing rail Jean from north | Lincoln | 0.0 | 1.6 | 167.8 | 169.4 | 0.0 | 294.3 | 0.8 |
| Apex | NV existing rail Apex from north | Lincoln | 0.0 | 1.6 | 167.8 | 169.4 | 0.0 | 294.3 | 0.8 |
| Apex | NV existing rail Apex from north | Clark | 0.0 | 0.0 | 50.8 | 50.8 | 0.0 | 0.0 | 2.0 |
| Apex | NV existing rail Apex from south | Clark | 3.2 | 17.7 | 100.9 | 121.8 | 1,879.6 | 750.6 | 1.4 |
| Caliente | NV existing routing to Caliente from north | Lincoln | 0.0 | 0.0 | 64.7 | 64.7 | 0.0 | 0.0 | 0.8 |
| Caliente | NV existing routing to Caliente from south | Clark | 3.2 | 17.7 | 151.7 | 172.6 | 1,879.6 | 750.6 | 1.6 |
| Caliente | NV existing routing to Caliente from south | Lincoln | 0.0 | 1.6 | 103.1 | 104.7 | 0.0 | 294.3 | 0.9 |
| Eccles | NV existing routing to Eccles from north | Lincoln | 0.0 | 0.0 | 56.3 | 56.3 | 0.0 | 0.0 | 0.0 |
| Eccles | NV existing routing to Eccles from south | Clark | 3.2 | 17.7 | 151.7 | 172.6 | 1,879.6 | 750.6 | 1.6 |
| Eccles | NV existing routing to Eccles from south | Lincoln | 0.0 | 1.6 | 111.4 | 113.1 | 0.0 | 294.3 | 1.3 |
| Dry Lake | NV existing routing to Dry Lake from north | Lincoln | 0.0 | 1.6 | 167.8 | 169.4 | 0.0 | 294.3 | 0.8 |
| Dry Lake | NV existing routing to Dry Lake from north | Clark | 0.0 | 0.0 | 50.8 | 50.8 | 0.0 | 0.0 | 2.0 |
| Dry Lake | NV existing routing to Dry Lake from south | Clark | 3.2 | 17.7 | 100.9 | 121.8 | 1,879.6 | 750.6 | 1.4 |

a. To convert kilometers to miles, multiply by 0.62157.

**Table J-35.** Populations in Nevada within 800 meters (0.5 mile) of routes.[a,b]

| Transportation scenario | Population 2035 projections |
|---|---|
| *Legal-weight truck routes*[a] | 190,000/300,000 |
| *Rail routes Nevada border to branch rail line*[b] | |
| Caliente (from the North – UT) | 110 |
| Caliente (from the South – CA) | 115,000 |
| Beowawe (from the east – UT) | 21,000 |
| Beowawe (from the west – CA) | 98,000 |
| Eccles (from the North – UT) | 3 |
| Eccles (from the south – CA) | 115,000 |
| Jean (from the North – UT) | 114,000 |
| Jean (from the South – CA) | 250 |
| Dry Lake (from the North – UT) | 1,900 |
| Dry Lake (from the South – CA) | 113,000 |
| *Branch rail lines* | |
| Caliente | 140 |
| Carlin | 1,280 |
| Caliente-Chalk Mountain | 31 |
| Jean | 520 |
| Valley Modified | 75 |
| *Heavy-haul routes* | |
| Caliente | 11,000 |
| Caliente/Chalk Mountain | 740 |
| Caliente/Las Vegas | 187,000 |
| Sloan/Jean | 390,000 |
| Apex/Dry Lake | 186,000 |

a. The estimated populations represent using the route from the north and from the south, respectively.
b. The analysis assumed there would be an average of 800,000 visitors per day to Las Vegas.

**Table J-36.** Potential road upgrades for Caliente route.[a]

| Route | Upgrades |
|---|---|
| Intermodal transfer station to U.S. 93 | Pave existing gravel road. |
| U.S. 93 to State Route 375 | Asphalt overlay on existing pavement, truck lanes where grade is greater than 4 percent (minimum distance of 460 meters[b] per lane), turnout lanes every 32 kilometers[c] (distance of 305 meters per lane), widen road. |
| State Route 375 to U.S. 6 | Remove existing pavement, increase road base and overlay to remove frost restrictions, truck lanes where grade is greater than 4 degrees (minimum distance of 460 meters per lane), turnout lanes every 32 kilometers (distance of 305 meters per lane), widen road. |
| U.S. 6 to U.S. 95 | Same as State Route 375 to U.S. 6. |
| U.S. 95 to Lathrop Wells Road | Remove existing pavement on frost restricted portion, increase base and overlay to remove frost restrictions, turnout lanes every 8 kilometers (distance of 305 meters per lane), construct bypass around intersection at Beatty, bridge upgrade near Beatty. |
| Lathrop Wells Road to Yucca Mountain site | Asphalt overlay on existing roads. |

a. Source: DIRS 154448-CRWMS M&O (1998, all).
b. To convert meters to feet, multiply by 3.2808.
c. To convert kilometers to miles, multiply by 0.62137.

**Table J-37.** Potential road upgrades for Caliente/Chalk Mountain route.[a]

| Route | Upgrades |
|---|---|
| Intermodal transfer station to U.S. 93 | Pave existing gravel road. |
| U.S. 93 to State Route 375 | Asphalt overlay on existing pavement, truck lanes where grade is greater than 4 percent (minimum distance of 460 meters[b] per lane), turnout lanes every 32 kilometers[c] (distance of 305 meters per lane), widen road |
| State Route 375 to Rachel | Remove existing pavement, increase road base and overlay to remove frost restrictions, turnout lanes every 32 kilometers (distance of 305 meters per lane), widen road. |
| Rachel to Nellis Air Force Range[d] | Pave existing gravel road. |
| Nellis Air Force Range Roads | Rebuild existing road. |
| Nevada Test Site Roads | Asphalt overlay on existing roads. |

a. Source: DIRS 155436-CRWMS M&O (1997, all).
b. To convert meters to feet, multiply by 3.2808.
c. To convert kilometers to miles, multiply by 0.62137.
d. Also known as the Nevada Test and Training Range.

**Table J-38.** Potential road upgrades for Caliente/Las Vegas route.[a]

| Route | Upgrades |
|---|---|
| Intermodal transfer station to U.S. 93 | Pave existing gravel road. |
| U.S. 93 to Interstate 15 | Asphalt overlay on existing pavement, truck lanes where grade is greater than 4 percent (minimum distance 460 meters[b] per lane), turnout lanes every 32 kilometers[c] (distance of 305 meters per lane), widen road, rebuild Interstate 15 interchange. |
| Interstate 15 to U.S. 95 | Increase existing two-lane Las Vegas Beltway to four lanes, asphalt overlay on U.S. 95. |
| U.S. 95 to Mercury | Asphalt overlay on U.S. 95. |
| Mercury Exit to Yucca Mountain site | Asphalt overlay on Jackass Flats Road, rebuild road when required. |

a. Source: DIRS 154448-CRWMS M&O (1998, all).
b. To convert meters to feet, multiply by 3.2808.
c. To convert kilometers to miles, multiply by 0.62137.

**Table J-39.** Potential road upgrades for Apex/Dry Lake route.[a]

| Route | Upgrades |
|---|---|
| Intermodal transfer station to Interstate 15 | Rebuild frontage road to U.S. 93. Rebuild U.S. 93/Interstate 15 interchange. |
| Interstate 15 to U.S. 95 | Increase existing two-lane Las Vegas Beltway to four lanes. |
| U.S. 95 to Mercury Exit | Asphalt overlay on U.S. 95. |
| Mercury Exit to Yucca Mountain site | Asphalt overlay on Jackass Flats Road, rebuild road when required. |

a. Source: DIRS 154448-CRWMS M&O (1998, all).

**Table J-40.** Potential road upgrades for Sloan/Jean route.[a]

| Route | Upgrades |
|---|---|
| Intermodal transfer station to Interstate 15 | Overlay and widen existing road to Interstate 15 interchange, rebuild Interstate 15 interchange. |
| Interstate 15 to U.S. 95 | Increase existing two-lane Las Vegas Beltway to four lanes. |
| U.S. 95 to Mercury Exit | Asphalt overlay on U.S. 95. |
| Mercury Exit to Yucca Mountain site | Asphalt overlay on Jackass Flats Road, rebuild road when required. |

a. Source: DIRS 154448-CRWMS M&O (1998, all).

- The *Nevada Potential Repository Preliminary Transportation Strategy, Study 2* (DIRS 101214-CRWMS M&O 1996, all), further refined the analyses of potential rail corridor alignments presented in Study 1.

Public comments submitted to DOE during hearings on the scope of this environmental impact statement resulted in addition of a fifth corridor—Caliente-Chalk Mountain.

DOE has identified 0.4-kilometer (0.25-mile)-wide corridors along each route within which it would need to obtain a right-of-way to construct a rail line and an associated access road. A corridor defines the boundaries of the route by identifying an established "zone" for the location of the railroad. For this analysis, DOE identified a single alignment for each of the corridors. These single alignments are representative of the range of alignments that DOE has considered for the corridors from engineering design and construction viewpoints. The following paragraphs describe the alignments that have been identified for the corridors. Before siting a branch rail line, DOE would conduct engineering studies in each corridor to determine a specific alignment for the roadbed, track, and right-of-way for a branch rail line.

*Caliente Corridor Implementing Alternative.* The Caliente Corridor originates at an existing siding to the Union Pacific mainline railroad near Caliente, Nevada. The Caliente and Carlin Corridors converge near the northwest boundary of the Nellis Air Force Range (also known as the Nevada Test and Training Range). Past this point, they are identical. The Caliente Corridor is 513 kilometers (320 miles) long from the Union Pacific line connection to the Yucca Mountain site. Table J-41 lists possible alignment variations for this corridor.

*Carlin Corridor Implementing Alternative.* The Carlin Corridor originates at the Union Pacific main line railroad near Beowawe in north-central Nevada. The corridor is about 520 kilometers (331 miles) long from the tie-in point with the Union Pacific line to the Yucca Mountain site. Table J-42 lists possible variations in the alignment of this corridor.

*Caliente-Chalk Mountain Corridor Implementing Alternative.* The Caliente-Chalk Mountain Corridor is identical to the Caliente Corridor until it approaches the northern boundary of the Nellis Air Force Range (also known as the Nevada Test and Training Range). At this point the Caliente-Chalk Mountain Corridor turns south through the Nellis Air Force Range and the Nevada Test Site to the Yucca Mountain site. The corridor is 345 kilometers (214 miles) long from the tie-in point at the Union Pacific line to the Yucca Mountain site. Table J-43 lists possible alignment variations for this corridor.

*Jean Corridor Implementing Alternative.* The Jean Corridor originates at the existing Union Pacific mainline railroad near Jean, Nevada. The corridor is 181 kilometers (112 miles) long from the tie-in point at the Union Pacific line to the Yucca Mountain site. Table J-44 lists possible variations for this corridor.

*Valley Modified Corridor Implementing Alternative.* The Valley Modified Corridor originates at an existing rail siding off the Union Pacific mainline railroad northeast of Las Vegas. The corridor is about 159 kilometers (98 miles) long from the tie-in point with the Union Pacific line to the Yucca Mountain site. Table J-45 lists the possible variations in alignment for this corridor.

### Land Use Conflicts Along Potential Rail Corridors in Nevada

Figures J-13 through J-20 show potential land-use conflicts along candidate rail corridors for construction of a branch rail line in Nevada.

**Table J-41.** Possible variations of the Caliente Corridor.[a]

| Variation | Description[b] |
|---|---|
| Eccles Option | Included in corridor description. Crosses private land and BLM lands. No ROWs crossed. |
| Caliente Option[c] | Connects with Union Pacific line at existing siding in Town of Caliente. Crosses approximately twice the amount of private lands than the primary alignment. Crosses 2 ROWs – 1 telephone and 1 road (U.S. 93). |
| Crestline Option[c] | Connects with Union Pacific line near east end of existing siding at Crestline. Crosses approximately twice the private land as the corridor. Crosses 2 ROWs – 1 telephone and 1 road. |
| White River Alternate[c] | Avoids potential conflict of the corridor with Weepah Spring Wilderness Study Area. Would cross approximately 0.012 square kilometer (3 acres) of private land. |
| Garden Valley Alternate[c] | Puts more distance between corridor and private lands in Garden Valley and Coal Valley. Crosses 2 road ROWs and 2 pipelone ROWs. Crosses approximately same amount of private land as corridor. |
| Mud Lake Alternate[c] | Travels farther from west edge of Mud Lake, which has known important archaeological sites. Mud Lake contains 4 possible route variations that are located on BLM lands. |
| Goldfield Alternate[c] | Avoids crossing Nellis Air Force Range boundary near Goldfield, avoiding potential land-use conflicts with Air Force. Crosses mostly BLM lands but also crosses approximately 0.75 square kilometer of private lands. |
| Bonnie Claire Alternate[c] | Avoids crossing Nellis Air Force Range boundary near Scottys Junction, avoiding potential land-use conflicts with Air Force. Crosses mostly BLM lands but also crosses approximately 0.43 square kilometer of private property. Crosses a BLM utility corridor, 3 road ROWs, 2 telephone ROWs, and 4 power ROWs. Crosses Timbisha Shoshone trust lands parcel. |
| Oasis Valley Alternate[c] | Enables flexibility in crossing environmentally sensitive Oasis Valley area. If DOE selected a route through this area, further studies would ensure small environmental impacts. |
| Beatty Wash Alternate[c] | Provides alternate corridor through Beatty Wash that is longer, but requires less severe earthwork than the corridor. |

a. Source: DIRS 131242-CRWMS M&O (1997, all).
b. Abbreviations: BLM = Bureau of Land Management; ROW = right-of-way.
c. Common with Carlin Corridor.

### *Minority Populations Along Potential Transportation Routes in Nevada*

Census Bureau information available to DOE and considered in this EIS includes geographical identification of census blocks containing minority populations within the environmental justice definition used by DOE (that is, a minority population is one in which the percent of the population of an area's racial or ethnic minority is 44.8 percentage points or more of the total population).

There is no corresponding census block information for low-income populations. To provide the information on minority census blocks to decisionmakers and the public, DOE has prepared a set of maps (Figures J-21 through J-30) showing the location of minority census blocks near potential transportation corridors. The maps depict 6-kilometer bands on each side of each corridor.

Darkly shaded areas represent minority blocks in or near the 6-kilometer bands. Lightly shaded areas represent the balance of land within the 6-kilometer bands. Dotted areas of intermediate shading represent Native American lands. All lands shown on maps and not represented as minority block or Native American is land that does not have a minority population within the definition used in this EIS (see Chapter 3, Section 3.1.13.1) to consider environmental justice concerns.

**Table J-42.** Possible variations of the Carlin Corridor.[a]

| Variation | Description[b] |
|---|---|
| Crescent Valley Alternate | Diverges from the corridor near Cortez Mining Operation where it would cross a proposed pipeline ROW that would supply water to the Dean Ranch; travels through nonagricultural lands adjacent to alkali flats but would affect larger area of private land. Crosses 2 existing roads, one of which has an established ROW. |
| Wood Spring Canyon Alternate | Diverges from the corridor and use continuous 2-percent grade to descend from Dry Canyon Summit in Toiyabe range; is shorter than the corridor segment but would have steeper grade. Continues on BLM land. |
| Rye Patch Alternate | Travels through Rye Patch Canyon, which has springs, riparian areas, and game habitats; diverts from the corridor, maintaining distance of 420 meters[c] from Rye Patch Spring and at least 360 meters from riparian areas throughout Rye Patch Canyon, except at crossing of riparian area near south end of canyon; avoids game habitat (sage grouse strutting area). Passes through a BLM utility corridor, one road and one road ROW (U.S. 50). |
| Steiner Creek Alternate | Diverges from the corridor at north end of Rye Patch Canyon. Avoids crossing private lands, two known hawk-nesting areas, and important game habitat (sage grouse strutting area) in the corridor. Passes close to Steiner Creek WSA. |
| Smoky Valley Option | Travels through less populated valley than Monitor Valley Option. Crosses more ROWs than Monitor Valley Option. Passes through all BLM land until route enters NTS. Passes through a Desert Land Entry area. |
| Monitor Valley Option | Travels through less populated Monitor Valley (in comparison to Big Smoky Valley). Crosses the Monitor, Ralston, and Potts grazing allotments. Also passes through 2 areas with application to Desert Land Entry Program. Passes 2 road ROWs, 1 telephone, 1 pipeline, and 3 powerline ROWs. |
| Mud Lake Alternate[d] | Travels farther from west edge of Mud Lake, which has known important archaeological sites. Mud Lake contains 4 possible route variations that are located on BLM lands. |
| Goldfield Alternate[d] | Avoids crossing Nellis Air Force Range boundary near Goldfield, avoiding potential land-use conflicts with Air Force. Crosses mostly BLM lands but also crosses approximately 0.75 square kilometer[e] of private lands. |
| Bonnie Claire Alternate[d] | Avoids crossing Nellis Air Force Range boundary near Scottys Junction, avoiding potential land-use conflicts with Air Force. Crosses mostly BLM lands but also crosses approximately 0.43 square kilometer of private property. Crosses a BLM utility corridor, 3 road ROWs, 2 telephone ROWs, and 4 power ROWs. Crosses Timbisha Shoshone trust lands parcel. |
| Oasis Valley Alternate[d] | Enables flexibility in crossing environmentally sensitive Oasis Valley area. If DOE selected a route through this area, further studies would ensure small environmental impacts. |
| Beatty Wash Alternate[d] | Provides alternate corridor through Beatty Wash that is longer, but requires less severe earthwork than the corridor. |

a. Source: DIRS 131242-CRWMS M&O (1997, all).
b. Abbreviations: BLM = Bureau of Land Management; NTS = Nevada Test Site; ROW = right-of-way; WSA = Wilderness Study Area.
c. To convert meters to feet, multiply by 3.2808.
d. Common with Caliente corridor.
e. To convert square kilometers to acres, multiply by 247.1.

Although the populations of most census blocks are small, the size of many blocks is large. The depiction of minority blocks does not show the location of any residences within blocks. Census bureau data did not include residential locations. No inference should be drawn from these maps as to the location of residences within depicted areas.

**Table J-43.** Possible variations of the Caliente-Chalk Mountain Corridor.

| Variation | Description |
|---|---|
| Caliente Option | Same as Table J-41. Connects with Union Pacific Line at existing siding in Town of Caliente. |
| Eccles Option | Same as Table J-41. |
| Orange Blossom Option | Crosses Nevada Test Site land. Bypasses roads and facilities. |
| Crestline Option | Same as Table J-41. Connects with Union Pacific line near east end of existing siding at Caliente. |
| White River Alternate | Same as Table J-41. Avoids potential conflict with Weepah Springs Wilderness Study Area. |
| Garden Valley Alternate | Same as Table J-41. Puts more distance between rail corridor and private lands in Garden Valley and Coal Valley. |
| Mercury Highway Option | To provide flexibility in choosing path through Nevada Test Site, travels north through center of Nevada Test Site. Requires slightly less land [approximately 0.2 square kilometers (50 acres)] than corridor. Crosses Mercury Highway. |
| Topopah Option | To provide flexibility in choosing path through Nevada Test Site, travels north along western boundary of Nevada Test Site. |
| Mine Mountain Alternate | Provides flexibility in minimizing impacts to local archaeological sites. |
| Area 4 Alternate | Provides flexibility in choosing path through Nevada Test Site. Crosses Mercury Highway. Requires slightly less land. |

a. Source: DIRS 155628-CRWMS M&O (1997, all).

### J.3.1.3 Sensitivity of Analysis Results to Routing Assumptions

In addition to analyzing the impacts of using highway routes that would meet U.S. Department of Transportation requirements for transporting spent nuclear fuel, DOE evaluated how the estimated impacts would differ if legal-weight trucks used other routes in Nevada. Six other routes identified in a 1989 study by the Nevada Department of Transportation (DIRS 103072-Ardila-Coulson 1989, pp. 36 and 45) were selected for this analysis. The Nevada Department of Transportation study described the routes as follows:

**Route A.** Minimum distance and minimum accident rate.
South on U.S. 93A, south on U.S. 93, west on U.S. 6, south on Nevada 318, south on U.S. 93, south on I-15, west on Craig Road, north on U.S. 95

**Route B.** Minimum population density and minimum truck accident rate.
Both of these two routes use the U.S. 6 truck bypass in Ely.

Alternative route possibilities were identified between I-15 at Baker, California and I-40 at Needles, California to Mercury. These alternative routes depend upon the use of U.S. 95 in California, California 127 and the Nipton Road.

**Route C.** From Baker with California 127.
North on California 127, north on Nevada 373, south on U.S. 95

**Route D.** From Baker without California 127.
North on I-15, west on Nevada 160, south on U.S. 95

**Route E.** From Needles with U.S. 95, California 127, and the Nipton Road.
North on U.S. 95, west on Nevada 164, west on I-15, north on California 127, north on Nevada 373, south on U.S. 95

**Route F.** From Needles without California 127 and the Nipton Road.
West on I-40, east on I-15, west on Nevada 160, south on U.S. 95